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APRIL 1, 1950

SCIENCE NEWS LETTER

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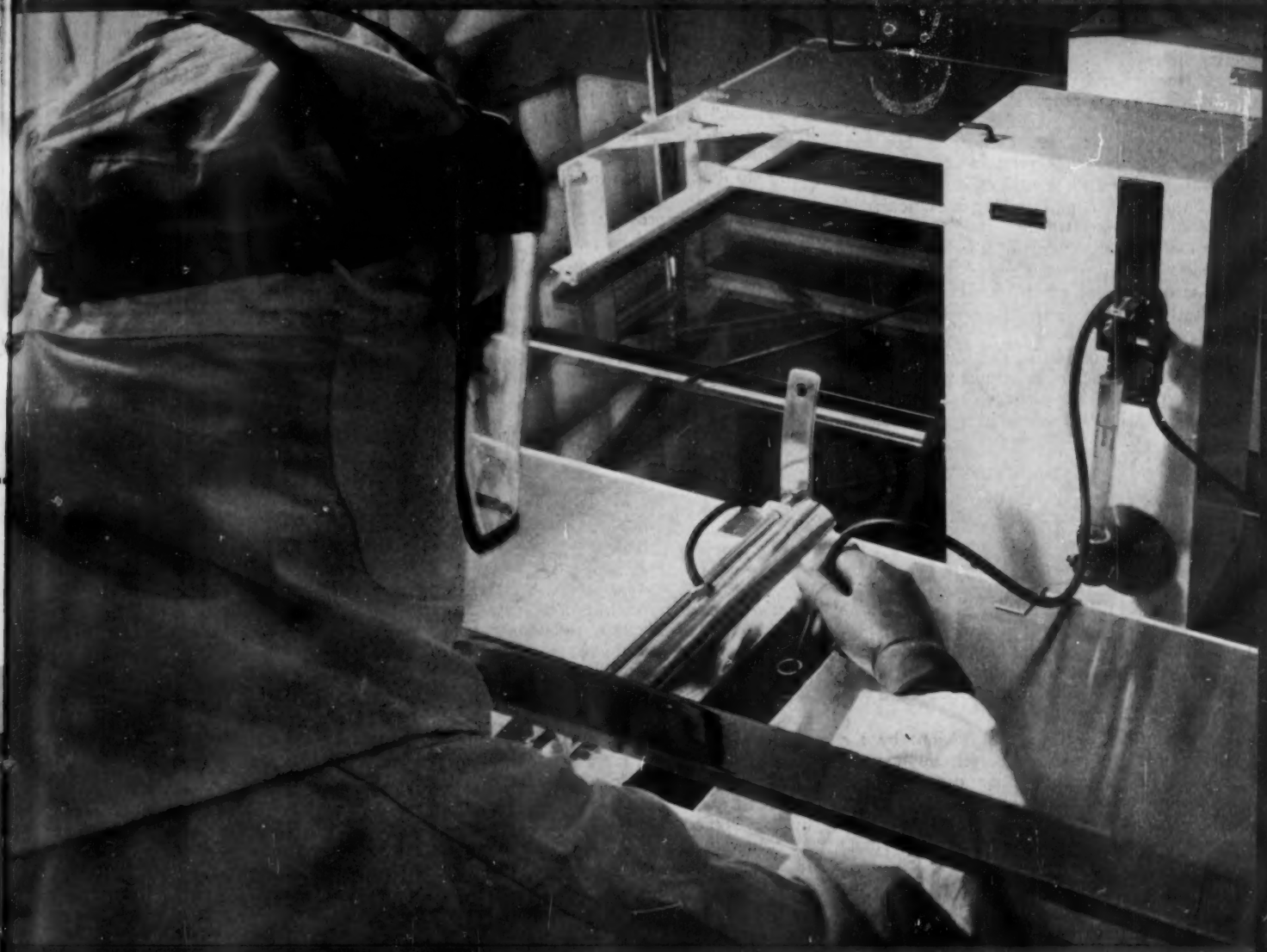
THE WEEKLY SUMMARY OF CURRENT SCIENCE



Off Limits Bacteria

See Page 199

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ANTHROPOLOGY

'50 Romeo Not Romantic

➤ A MODERN Romeo can't hold a candle to the average buck in some of the primitive societies of South Africa when it comes to romantic courtship, asserts an anthropologist who recently made a study of the tribesmen.

Dr. Edwin M. Loeb, who was a member of the recent University of California African Expedition, has just completed an analysis of "Courtship and the Love Song," in which he cites courtship customs among the tribesmen as well as among other peoples both past and present.

The anthropologist said the courtship customs of the primitives are a lot more intricate and leave much more room for ingenuity and spontaneity than among modern young people.

All the ancient flourishes—the love lyrics, the rhymed riddles exchanged between lovers, spontaneous verses and secret languages of courtship—still exist among some of the tribes. Also, bundling is "unionized" in at least one tribe.

Only among some of the cattle-raising peasants of Europe are any of these customs, one or more of which once existed among nearly all peoples, still followed outside of primitive societies.

Dr. Loeb said that the love song and the complexities of courtship which attend it seem to be the product of delayed marriage and the frustrations resulting therefrom.

Delayed marriage—and romantic love—is characteristic of cattle-raising societies from Switzerland to Southwest Africa and to Sumatra. The delay is caused by the difficulty of accumulating enough wealth, in the form of cattle, to set up housekeeping.

Rhymed riddles are important in courtship in some parts of South Africa. When the girl puts riddle to the boy, the boy must answer in rhyme. Upon his wit may depend the Romeo's success.

During group dances, verses are spontaneously composed and sung by the participants, and the boys ask for bundling dates. Bundling is both chaste and carefully supervised among some of the tribes.

In one tribe, the Dinka, bundling is "unionized." All the boys of an age group have vested rights to bundling with all the girls of the same age group. If a boy wants to bundle with a particular girl, he must ask permission of his age fellows. If the fellows approve, they approach the girl on the boy's behalf.

Dr. Loeb said that "necking" is the modern American counterpart of bundling, an ancient custom which was widely practiced in colonial America.

The anthropologist said that the love song and the other ancient flourishes of romantic love are largely confined, in America, to the stage.

Science News Letter, April 1, 1950

GENERAL SCIENCE

Good Neighbors in Science

➤ SCIENTIFIC and technological "know-how" is playing an important part in promoting the "good neighbor" policy among the Americas, it is evident from a timely report of the Illinois Institute of Technology, Chicago, Ill.

The work is being carried out by the institution's Armour Research Foundation, a not-for-profit corporation organized and operated to provide a confidential and independent research and engineering service to industry, government and the general public.

Since 1942 an international division of the Foundation has provided for other nations the same impartial, non-profit, non-political industrial research available in the United States. A research center established in Mexico City is an example of the method of procedure and what can be accomplished.

The Armour plan was brought to Mexico in 1944 at the request of local authorities. The first step taken was a nation-wide technological audit made jointly by United States and Mexican technologists. The audit revealed many possibilities for new and wider usage of Mexican resources which could contribute to the economy of the nation and its people.

Following the survey, laboratory research and development were started at once on the industrialization of cascalote tannin, the domestic extraction of quinine, the improved domestic production of oils for treatment and finishing of leather, and the development of by-products of henequen, a valuable plant for its rope or cord fiber.

The research on henequen has proven particularly valuable. After the sisal fiber for ropes has been taken out, the waste pulp was found to be able to yield a wax with properties similar to the widely used Brazilian carnauba wax. The new product has been valued as worth $20,000,000 annually in exports to the United States.

A well-equipped laboratory building has now been constructed in Mexico City for the Armour project. Mexican scientists are being trained to carry on all activities. The number of American scientists to be employed will be limited. However, technical help from the Foundation in Chicago, with a staff of some 650 persons, will always be available.

Science News Letter, April 1, 1950

PLANT PATHOLOGY

Apple Scab Makes Earliest Appearance Yet

➤ APPLE scab appeared in Delaware and Illinois this year at the earliest dates on record. The orchard disease costs U. S. apple growers millions of dollars annually.

Scientists at the Universities of Delaware and Illinois reported the early development of characteristc leaf blotches to the Department of Agriculture. If not checked by spraying, the infection spreads to the blossoms and fruit. It can ruin high percentages of an orchard's yield.

A mild winter coupled with exceptionally warm weather in January was blamed for the record appearance of the disease.

Science News Letter, April 1, 1950

ENGINEERING

Small-size TV Tube Has Industrial Applications

➤ A NEW small-size television pick-up tube, called the "vidicon," was revealed in New York to the Institute of Radio Engineers by P. K. Weimer, S. V. Forgue and R. R. Goodrich of the Radio Corporation of America, Princeton, N. J. It is particularly designed for industrial applications.

The new tube is one inch in diameter and six inches long. Now in an advanced stage of experimental development, it employs a photo-conductive target. Photo-conductivity offers the possibility of designing a television pick-up tube in its simplest, most sensitive and most compact form, the scientists stated.

Photo-conduction is the property of a poor conductor of electricity in darkness of becoming a good conductor when exposed to light, as a result of the freer passage of electrons under the influence of the light.

With this new tube, according to the RCA scientists, the target sensitivity is sufficiently high to permit operation at moderate light levels without requiring an electron multiplier.

A miniature television camera system developed around the new vidicon pick-up tube was described by R. C. Webb and J. M. Morgan, also of the RCA Laboratories at Princeton, N. J.

A simplified self-contained synchronizing generator in the master control-monitor unit establishes a scanning rate identical with the generally used standards for broadcasting. This makes it possible to use existing TV receivers with the system.

Science News Letter, April 1, 1950

MEDICINE

ACTH Predicts Survival

The relation between this hormone, the adrenal glands and certain white blood cells helps to predict the probability of survival of surgery patients.

➤ ACTH, the pituitary gland hormone famous for its anti-arthritis activity, gives a good way to foretell whether a patient will survive the strain of a surgical operation.

Successful use of the hormone for this purpose is reported by Dr. M. Roche and G. W. Thorn of Peter Bent Brigham Hospital and Harvard Medical School in Boston, Mass., and Dr. A. G. Hills of the University of Pennsylvania Hospital and Medical School, Philadelphia, in the NEW ENGLAND JOURNAL OF MEDICINE (March 2).

Predicting the probable outcome of operations through ACTH depends on the relation between this hormone, the adrenal glands and certain white blood cells called eosinophils.

In actual practice, the number of eosinophils in the blood is counted, a standard small amount of ACTH is injected, and four hours later the eosinophils are again counted. A marked fall in number of eosinophils four hours after ACTH shows that the patient probably will come through the operation in good shape.

If there is no drop in eosinophil blood cells, the risk of operation is great because the patient probably does not have the necessary reserve power in his adrenal glands.

To survive a major surgical operation, a patient must have sound, healthy adrenal glands. The cortex, or outer part, of the glands which produces cortisone must in particular be in good condition. Patients with Addison's disease, which is a disease of adrenal gland cortex, seldom survive even a minor surgical operation unless protected by large doses of adrenal hormones in advance of the operation.

In patients with normal adrenal glands, the eosinophils disappear almost completely from the blood during the first 24 to 48 hours after a major operation. The reason for this is not yet known. Large numbers of eosinophils in the blood during the first 24 to 48 hours after operation suggests that the adrenal glands are not producing enough of their hormones to protect the patient against the stress of the operation.

ACTH, the adrenocorticotrophic hormone of the pituitary gland, is a stimulator of adrenal gland cortex activity. Consequently giving a small dose of ACTH and counting the eosinophils in the blood before and after shows how the adrenal gland cortex is functioning.

One of the patients on whom this test was used was a 47-year-old housewife who for two years had been having increasingly severe headaches. Her right eye was bulging and her right eyelid was drooping.

X-ray examination of the skull showed she probably had a brain tumor. Location of the tumor suggested that the pituitary gland might have been destroyed or severely damaged by it.

Operation to remove the tumor was imperative to save her eyesight. But the possible damage to the pituitary gland might keep this gland from stimulating the adrenal gland adequately to see her through the strain of the operation.

The ACTH test was performed. There was only a "modest" fall in the eosinophils. This suggested the pituitary-adrenal reaction would not be strong enough to protect her during the operation. Doses of ACTH were given overnight in an effort to stimulate the adrenal gland cortex. This was unsuccessful as shown by the blood test, but the operation was undertaken nevertheless.

Shortly after the ether had been given and before the surgeon had started to cut, she turned blue and went into shock. The operation was postponed until six days later. By this time she had been given enough large doses of ACTH to produce the drop in eosinophils and her general condition seemed better.

The operation was then performed, the patient survived, her eyes returned to normal and the headaches disappeared.

Science News Letter, April 1, 1950

AGRICULTURE

Cheaper Coffee in Future

➤ U. S. scientists working in Central America may some day make high coffee prices at home a thing of the past. But not this year.

World demand for coffee has outstripped production. Department of Agriculture says world production has actually decreased since World War II. Increased consumption of coffee in the United States, in addition to production decrease, is blamed for the sharp boost in coffee prices last fall.

A USDA report reveals, however, that its coffee specialists have been at work in Guatemala, El Salvador and Costa Rica for four years. Goal of their small-scale Point Four program: To double or even treble

FROM ONE-TENTH TO FIFTEEN—Measured harvests of 60 blocks of 100 trees each proved that the yield of coffee cherries varies from one-tenth of a pound (left) to 15 pounds (right) of dry coffee per tree per year. Janie Cowgill holds the baskets.

Central American coffee yields.

Dr. William H. Cowgill, 36-year-old plant scientist, heads the U. S. technical team. There is a high-altitude research station at "Finca Chocola," Guatemala.

Working with agricultural scientists in the cooperating countries, the Americans improve coffee production by applying techniques of U. S. fruit growers. Selection of superior trees, culling out of "water" trees, crop rotation and better culture methods are among the tricks being taught.

Improvements cannot be put into general practice overnight. But already yield increases are a reality. The U. S. experts hope to see the Guatemalan average, for example, boosted from one pound per tree to three, four or even five pounds.

In 1949 this country imported 2,917,000,000 pounds of green coffee, Department of Agriculture reports. Eighty percent of it came from Brazil and Colombia, only 11.5% from Central America.

If by scientific methods Central American growers can increase their production several-fold, the effect will be quickly felt in U. S. coffee supplies and grocers' prices, the Agriculture Department believes.

Science News Letter, April 1, 1950

METEOROLOGY

Predict Colder April than Normal for Most of U. S.

➤ IT will be colder than normal the first half of April over the eastern two-thirds of the country. In the far west and along the Gulf of Mexico coast, temperatures for the last of March and first of April were predicted to be not far from normal.

This is the second U. S. Weather Bureau extended forecast to be released to publications. The first half of March generally bore out the monthly prediction made at the beginning of March.

Heavier rainfall than normal from mid-March to mid-April was predicted for the south central, southeastern and northwestern portions of the country. More than enough April showers, at least for the first half of the month, to bring May flowers.

In the rest of the country, rainfall will be generally normal, or slightly less than normal.

Jerome Namias, chief of the Bureau's Extended Forecast Section, warns that his predictions do not hold good for limited areas and represent averages over an entire month.

Science News Letter, April 1, 1950

GEOLOGY

Phosphate Deposits Found Off Florida Coast

➤ MAJOR deposits of phosphates may lie on the floor of the Gulf of Mexico off the Florida coast, Robert H. Stewart, a Government geologist, reports.

Within the past year the spotlight has been turned on phosphates, the fertilizer raw material that can make an acre of land feed more people. Scientists discovered phosphate rock contains low concentrations of uranium and other fissionable materials vital to atomic energy.

Little is known about underwater deposits of phosphates. A unit of the U. S. Geological Survey is in Plant City, Fla., studying land deposits which make Florida the nation's leading phosphate producer. Survey officials admitted the study is part of U. S. atomic research.

While on a fishing trip off Tampa, Mr. Stewart and another geologist with the unit found evidence of phosphates. They took samples, and found the material covered the bottom of the Gulf over a 25-mile area, Mr. Stewart told the Geological Society of Washington. Fishermen's reports indicate the deposits may extend as far south as Fort Myers, he said.

The possibility they could be exploited commercially is "remote," Mr. Stewart added. Too little is known about them. Technical processes do not exist for separating them from sea-water sands.

But more attention may be paid to such underwater phosphates. In January the semi-annual report of the Atomic Energy Commission said the extraction of uranium from low-grade materials is of major importance to the nation's atomic energy program.

Science News Letter, April 1, 1950

● RADIO

Saturday, April 8, 3:15 p.m., EST

"Adventures in Science" with Watson Davis, director of Science Service over Columbia Broadcasting System.

Dr. H. H. Schrenk, Research Director, Industrial Hygiene Foundation of America, Mellon Institute, Pittsburgh, will talk about "Pure Air for America."

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Question Box

AGRICULTURE

What program may result in cheaper, more plentiful coffee? p. 195.

ASTRONOMY

What has been predicted by Dr. Karl Schutte? p. 198.

DENTISTRY

What are the three best ways to stop bleeding after tooth extraction? p. 204.

GENERAL SCIENCE

What is the five point program for energy? p. 199.

What is the role of science in the good neighbor policy? p. 194.

What scientist was refused a passport to India? p. 197.

MEDICINE

How does ACTH predict the survival of surgery patients? p. 195.

What is the new treatment for insanity? p. 205.

Photographs: Cover, Commercial Solvents Corporation; p. 195, U. S. Department of Agriculture; p. 197, Boeing Airplane Company; p. 199, Union Carbide and Carbon Corporation; p. 202, 203, Dr. Leon F. Whitney.

GENERAL SCIENCE

Scientist Refused Passport

University of Rochester physicist is denied passport for a trip to India to study cosmic rays. State Department says trip contrary to best interests of the country.

➤ THE State Department has denied a passport to Dr. Bernard Peters, University of Rochester physicist, to go to India to do basic research on cosmic rays.

Mrs. Ruth Shipley, head of the passport division of the State Department, stated that the action was taken because Dr. Peters' trip to India would be "contrary to the best interests of this government." Dr. Peters worked for the atomic bomb project during the war and, a year and a half ago, was a witness before the House Un-American Activities Committee. At that time he declared under oath that he was not and never had been a member of the German or American or any communist party.

Dr. Alan Valentine, president of the University of Rochester, backed up Dr. Peters. After saying that he had conducted a personal investigation "at high government levels" into the Peters case, Dr. Valentine declared: "From that investigation nothing has emerged which in my opinion should impair our confidence in Dr. Peters as a scientist, a professor or an American citizen. He continues a member of the university faculty in full good standing."

Dr. Peters, who was sent to the Dachau concentration camp early in the Hitler regime and came to this country after he escaped, is known by his fellow physicists as a brilliant specialist in cosmic rays. He had been invited to go to India on a six-week cosmic ray project by the Tata Institute of India. Cosmic rays come into our world from somewhere in the universe and, in the study of these rays, scientists can gain more knowledge of what our universe is like.

Other physicists were looking forward eagerly to the results of Dr. Peters' six-week trip to India to give them another important link in our knowledge. The Office of Naval Research, with which the University of Rochester has the contract under which Dr. Peters would have gone to India, had already shipped $12,000 worth of equipment for the project.

India was chosen because the earth's magnetic field affects the composition of cosmic rays striking various parts of the earth. In the latitude of India can be found the kind of cosmic rays Dr. Peters wanted to study.

Dr. Valentine declared that "all of the work he would have done in India is of an open and wholly non-secret nature."

University officials are known to be determined not to send any other physicist in Dr. Peters' place, preferring to abandon the contract for this particular project.

In a letter to Secretary of State Dean Acheson after his application was turned down, Dr. Peters wrote:

"I have been completely unsuccessful in learning the nature of the charges which in the opinion of the government justified the treatment which I have been accorded. Both my own efforts in this direction and those undertaken by the administration of this University have been entirely fruitless."

"Of all the problems which the ambiguous attitude of the government has created," he wrote Secretary Acheson, "I consider the effect on my children to be the most serious one. They have been growing up in an atmosphere of secret dossiers, tapped telephones and incredible slanders against their family without any means of combatting them."

Dr. Valentine concluded his statement by saying: "The atmosphere and procedures in these matters in Washington are at present peculiar. But we note that a man's reputation and career have been greatly threatened and perhaps even ruined without his being given an opportunity to hear the grounds for such action, to identify and face his accusers and to offer his defense. It was my impression that our government protected its citizens against such practice. In this case the citizen appears to need protection from his own government.

"Consequently we do not regard this case as closed, and we shall continue to inquire as best we can into the status of Dr. Peters and the status of American justice."

Dr. Peters stated he would make reapplication to the State Department in September.

"At that time of the year," he explained, "the cosmic rays to be found near the magnetic equator will be the kind I want to study."

However, a State Department spokesman said any new application Dr. Peters makes will be considered and a passport will be granted if he can show that it would not be contrary to the best interests of this government.

Dr. Peters said that he also wanted to re-apply because that action might provide an opportunity to clear up what he considers to be a blot upon his reputation. He said that he would be willing to answer any questions the State Department cared to put to him.

Science News Letter, April 1, 1950

AERONAUTICS

Details of In-flight Refueling System Revealed

➤ WRAPS on the Boeing-developed device to feed fuel from a flying tank plane to another plane in the air were removed in Seattle, Wash., at least in part. It is a development that will greatly increase the

***GAS STATION IN THE CLOUDS**—The B-29 tanker aircraft, above and to right, is pumping aviation gasoline at high speed to a new Boeing B-50D Superfortress medium bomber through the Flying Boom. Small surfaces known as "ruddevators" control the boom from side to side and up and down and may be operated in all kinds of weather.*

range of war planes by assuring a dependable in-flight aircraft refueling system.

This so-called Flying Boom for refueling was announced by the Air Force, for which it was developed, some six months ago. Details were omitted. It was developed to eliminate as far as possible some of the difficulties of earlier methods of refueling in which gravity was relied upon to bring the aviation fuel from a tanker plane to receiver through a flexible hose.

In this system the feeder pipe is rigid, and the fuel is transferred by pressure. Refueling time is greatly shortened. The boom makes it possible to refuel in flight with greater speed and at higher altitudes than previously was possible.

In the refueling process, the tanker plane flies above and a little to the front of the plane to receive the fuel. The boom is telescoped down and out from beneath the tanker and is inserted atop the nose of the receiver.

Control of the fueling tube is possible through the use of small vee-shaped surfaces, known as "ruddevators," which govern movements of the fueling boom.

A crewman of the tanker plane, in a rear turret in the position occupied by the tail guns of combat planes, operates the ruddevator controls and places the fueling tube nozzle into the socket on the receiving plane.

Science News Letter, April 1, 1950

ASTRONOMY

Tenth Planet Predicted

➤ A TENTH planet, even farther from the earth than Pluto, is now being predicted by Dr. Karl Schutte of Munich, Germany.

Its discovery, if made on the basis of Dr. Schutte's prediction, will be "unique," a Harvard astronomer states.

Dr. Schutte finds a trans-Plutonian planet necessary to account for a new family of comets. He has been studying the distributions of the comets, orbits, or paths.

It would be a Herculean job for astronomers to prove the existence of the proposed planet. The planet would be extremely faint and would move very slowly.

Pluto, the ninth planet of our system whose discovery was announced in 1930, has a magnitude of 15.5 photographically and 14.7 visually. The new planet would be even fainter than Pluto.

Dr. Schutte reports his findings in the German popular astronomical journal, STERNENWELT. Commenting on the prediction in SKY AND TELESCOPE, Dr. Dorrit Hoffleit of Harvard College Observatory states: "Unique in the history of astronomy would be the discovery of a planet predicted from the observations of comets."

The new planet predicted by Dr. Shutte would be at the distance of approximately 77 astronomical units from the earth. An astronomical unit is the mean distance between the earth and the sun, a little more than 93,000,000 miles. Therefore, the distance of the suspected planet would be 93,000,000 miles times 77, or 7,161,000,000 miles.

Dr. Shutte had been examining the distributions of all of the orbits of comets with periods of less than 80 years. These paths have been figured quite exactly by astronomers.

He found that, with the single exception of comet Encke, all of these comets appeared to belong to discrete "families" of the planets that are farthest from the earth.

Jupiter has the largest family with 53 known comets as members. Saturn has 6, Uranus 3 and Neptune 8 comets in their respective families. The aphelion distances of these comets average about 10% greater than the aphelion distances of the planets that captured them. The point in the path of a heavenly body that is at the greatest distance from the sun is known as aphelion. That which is at the closest distance is known as perihelion.

In the case of Jupiter, Dr. Hoffleit states, it is of particular interest to note that most of the aphelions of the comets are in the same direction as Jupiter's own aphelion. The planet moving more slowly at its aphelion than at perihelion, in accordance with the law of areas, has more time to capture comets as they speed by.

No comets were found with aphelion distances strikingly intermediate between those of the major planets. Turning his attention to comets with longer periods, Dr. Schutte found that they also had an average aphelion distance some 10% greater than the distance of their foster-parent.

The distance of the planet that should capture eight of these comets would be at about 77 astronomical units from the sun. This distance is in excellent agreement with the position that might be predicted for a trans-Plutonian planet from an astronomical rule-of-the-thumb known as Bode's law.

Science News Letter, April 1, 1950

GEOLOGY

Second Largest Meteor Dug Half-Mile-Wide Crater

➤ AUSTRALIA'S half-mile-wide Wolf Creek Crater was definitely blasted out by a meteor, studies at the Smithsonian Institution show.

The big hole was found in 1947 in the Western Australia wilderness by three American geologists prospecting for ojl by plane. The scientists thought at first it was caused by a volcanic explosion.

But analysis of rock fragments found nearby has shown they came from a giant meteorite, Dr. Edward P. Henderson, associate curator of the Smithsonian, told the Geological Society of Washington.

Wolf Creek Crater is 2,800 feet across at the bottom and 150 feet deep. The meteor that dug it, throwing up a rock rim 100 feet high, is the second largest on record ever to have hit the earth.

The biggest struck in Arizona. Indians named the pit, four-fifths of a mile across and 570 feet deep, Canyon Diablo.

Even bigger meteors may have collided with the earth in early geologic eras, although most are so small they burn themselves out in the atmosphere. But unless the missiles struck in an arid region, the craters would be slowly erased by erosion and other natural forces.

Dr. Henderson studied samples brought back by Dr. Frank Reeves, one of the oil company geologists who spotted Wolf Creek Crater. The Smithsonian mineralogist said the analysis showed 86.3% iron oxides, 4.3% nickel oxide, 1% each of potassium and cobalt oxides, and 7.1% water.

Scientists of Australia's Bureau of Mineral Resources also checked fragments, Dr. Henderson said. They agreed that the ironstone material was typical of meteorites.

Science News Letter, April 1, 1950

MINING

Separator Gets Rich Iron From Low-Grade Ores

➤ LOW grade iron ore is quickly separated from the crushed rock with which it is mixed by a new improved type magnetic separator revealed in Pittsburgh by Westinghouse Electric Corporation.

The new device operates on a somewhat different magnetic principle than previous separators. It is already under test at Aurora, Minn., extracting iron ore from magnetic taconite. It was developed particularly for this purpose.

The rich iron ore of the famous Mesabi Range is facing exhaustion. When gone, iron ore from that region will have to come from taconite of which there is a plentiful supply. It contains about 25% iron and 75% rock.

The new separator consists of a rotating drum mounted in a pulp box of special design. Stationary magnets within the drum provide the means whereby iron ore is extracted from the taconite.

As the mixture passes beneath the separator's rotating drum, the magnets draw the iron ore to the drum. The movement of the drum carries the ore through a washing zone and then away from the direct pull of the magnets.

The ore nodules produced in the process will be about 64% iron. This is several percent higher than the high-grade ores now used in blast furnaces.

Science News Letter, April 1, 1950

GENERAL SCIENCE

From Now On: Energy

A five-point program of energy exploration is needed to find out new sources of energy and more efficient means of utilizing present sources.

By WATSON DAVIS

The middle of the century is a good time for stocktaking for the future. Mr. Davis, for three decades a pioneer in interpreting science for the public, points out the opportunities for advances in science and technology in the coming years. This is the first of articles that will appear weekly.

➤ ENERGY is necessary for everything that happens in the world. In olden days, most of the applied energy was furnished by the muscle and brawn of men and domesticated animals.

Today coal, oil, water, and wood give us our gross power. Your muscle and mine are spared from working too hard.

Basically all the energy of this earth of ours comes from the sun. The heat and light of the sun, eight minutes away from us measured by radiation's travel-time, is a matter of life.

All the coal and the oil is fossil sunshine. We live on the stored energy of past ages. We spend extraordinary riches accumulated eons before our great-ever-so-great grandfathers began to evolve. If we did not have so much of it, every piece of coal and drop of oil would be like so much gold or uranium. It is unrenewable.

The energy we trap by harnessing the fall of water impounded by big dams is this year's production. So, too, the wood burned is using relatively recent sunshine, sun's energy only a few years old.

Human energy comes from the calories of our food, usually grown only a few months ago.

Experimentally, the fission of uranium, as in the atomic bomb, has opened a new story of energy, which again is unrenewable and extremely limited despite the fact that one pound of matter converted entirely into energy would furnish all the electrical power of the U.S.A. for nearly a month.

We are hardly on the ragged edge of an energy shortage, yet a long-time look ahead should worry us, for the sake of our children.

So valuable are coal and oil for the chemicals they contain that prohibition of their burning for power would be logical. We are getting ready to tap the world's great deposits of oil shale.

Our use of current imports of sunshine, poured on us by the sun, is woefully inefficient. The fields and forests use only a mere fraction of the radiation they receive. But we cannot build a factory that is as effective as the green leaf.

We need as vigorous a research effort on energy for the future as the Germans drove us to in developing atomic energy. We should be spending a billion dollars and ten thousand best brains on it. We need to:

A. Discover the secret of the green leaf (photosynthesis) and duplicate it chemically and mechanically, with real efficiency.

B. Explore for plants, whether algae or what, that can capture the sunshine better for food, chemicals and fuel.

C. Re-explore power from the temperature differences in the ocean, the ebb and flow of the tides, the rush of the winds, and direct heat of the sunshine. Sneers from self-contented exploiters of our lush energy stores should not deter us.

D. Study the sun and the stars for new hints as to how to convert matter into energy, for that is what stokes these flaming bodies.

E. Find other elements besides uranium and thorium that contain usable nuclear energy. (If this is not a prime project of the Atomic Energy Commission, it should be.)

Science News Letter, April 1, 1950

CHEMISTRY-ENTOMOLOGY

Pyrethrum Insecticide Synthesized Commercially

➤ A SYNTHETIC pyrethrum chemical, with the insect killing power of the pre-DDT pyrethrum from pyrethrum flowers, has now been made on a commercially practical scale.

"Allethrin" is probably the name which this new insecticide will have.

Pyrethrum-like chemicals, with the insect killing power of the plant material, were synthesized on a laboratory scale just a year ago by U. S. Department of Agriculture scientists. The commercial synthesis of one of these was recently announced by the Union Carbide and Carbon Corporation.

Science News Letter, April 1, 1950

On This Week's Cover

➤ THE MAN in the white mask is a worker in a microbiological pilot plant which manufactures antibiotics. He fills the vials in the sterile area with the liquid concentrate before drying in a vacuum. The antibiotics have made possible the conquest of such diseases as pneumonia and the venereal diseases and give promise of a remedy in the future for the common cold and other maladies.

Science News Letter, April 1, 1950

BLISTER TEST—The effect of allyl cinerin, a pyrethrum insecticide, is tested on cockroaches (under small screens) by Dr. Harry L. Haynes, entomologist at Boyce-Thompson Institute. Though not an official test method, this "blister" is a means of observing the effect of the insecticide with non-clogging and non-staining properties not possessed by the natural product.

AGRICULTURE

Premature Blossoms Now Controlled

➤ THE PRECOCIOUS fruit blossoms that burst forth early only to be caught by late spring frosts are now subject to chemical control.

Spraying a chemical upon raspberries and strawberries can delay temporarily their blossoming, Prof. David G. White of Pennsylvania State College has discovered.

Enormous losses to the fruit industry may be prevented through the application of this method of delaying flowering 10 days or more to avoid dangers of frost, Dr. White suggests in a report to the journal, SCIENCE (March 24).

The chemical used is maleic hydrazide in its diethanolamine salt applied in a water spray of 1,000 to 1,500 parts per million. These lower concentrations produce the effect without burning the foliage.

Both strawberries and black raspberries were treated last spring successfully, without permanent effect on general growth. Dr. White's experiments followed the discovery at Cornell's New York State College of Agriculture of the temporary inhibiting effect of maleic hydrazide on plant growth.

Science News Letter, April 1, 1950

MEDICINE

Finger-tip Test for Pain Killing Drugs

➤ A FINGER-TIP test for the effectiveness of pain-killing drugs has been developed by Arthur M. Schwartz, William K. Sata, and Daniel Laszlo at Montefiore Hospital, New York City.

The test is made by measuring the blood flow in a finger tip with an instrument called a plethysmograph while a brief electric shock is given at regular intervals to the back of the foot. Changes in blood flow brought on by this painful stimulus are then compared with changes for the same stimulus when morphine, codeine or other pain-relieving or anesthetic drug is given.

Details of the test are reported in SCIENCE (March 24).

Science News Letter, April 1, 1950

AGRICULTURE

Coal-Eating Pigs Cost More to Raise

➤ A COMMON belief among farmers that eating coal is good for pigs has been proven erroneous by scientists at the University of Wisconsin.

Experiments made by Robert H. Grummer, Gus Bohstedt and James H. Meyer, of the animal husbandry department, showed that while pigs like to crunch coal, doing so makes them less thrifty. It also fails to protect them from roundworms or from necrotic enteritis, a disorder of the intestines more commonly known as "necro." Many farmers have thought that it did.

In the tests, some pigs were given free access to soft and hard coal, and they ate from a fifth to a quarter pound a day. It was found that the soft coal, in particular, made the pigs consume more feed per pound of gain.

At the end of the tests, it had cost $1.15 more to put on 100 pounds of gain for the pigs that had eaten the soft coal. For the pigs eating hard coal, it cost 42 cents more to gain 100 pounds than the check lot without coal.

Science News Letter, April 1, 1950

AERONAUTICS

Drift Method Navigation Saves Time and Cost

➤ THE SHORTEST route for airplanes crossing the Atlantic is not always the quickest path. What is called the "average drift correction" method of navigating, which utilizes wind movements, saves time and cost, aviators have proved.

By means of the average drift method of navigation, airliners instead of bucking beam winds travel along with them. The pilot makes use of a forecast flight plan. This begins with the sketching of an upper air chart, projected for the expected time of the flight, that shows weather conditions 10,000 feet and higher across the Atlantic.

The algebraic sum of the beam winds that will be encountered during the entire flight is calculated and an average correction for drift is computed. This correction will usually be applied to the great circle headings during flight.

Flying the resulting headings, the aircraft is allowed to drift off its course with the wind. As it passes through the various pressure fields, the drift may be to the right or to the left, but when the craft reaches its destination it is "on course."

The time saving has been definitely proven, according to Lyle E. Brosche, La Guardia Field, senior meteorologist for Pan American World Airways. He reports the recent experience of three DC-4's, operated by three different international airlines which took off within an hour from Gander Field, Newfoundland.

One took the great circle or shortest route. One took what is called the rhumb line course, a single heading more southerly than the great circle route. The third used the average drift method with charts showing the winds and weather over the Atlantic, prepared by the Pan American meteorologists.

Elapsed time to reach London showed the "great circle" plane took nine hours and 15 minutes. The "rhumb line course" plane took 10 hours and 12 minutes. The user of the average drift method of navigation made the trip in eight hours and 38 minutes.

This is but one example. Pan American officials state that in less than two years the average drift correction method of navigation has saved the company more than half a million dollars.

Science News Letter, April 1, 1950

IN SCIENCE

PSYCHIATRY

14-Year-Old Boy Sneezes for 33 Days

➤ THE CASE of a 14-year-old school boy who sneezed from 3 to 30 times a minute for 33 days is reported by Dr. Neville Murray of the Banstead Hospital, Surrey, and Dr. Joshua Bierer of the Runwell Hospital, Essex.

The doctors could not find any report of any other case of sneezing of such long duration.

Cause of the sneezing, the doctors determined, was a conflict situation. The boy, though intelligent and ambitious, was foresaken by his father, overprotected by his neurotic mother and overshadowed at school and at home by a brilliant younger brother.

Escape from this grim reality came through the sneezing which gave him four gains: 1. He did not have to continue the unfair competition at school. 2. He became the center of attraction at school, bets being laid by his classmates on the number of seconds between sneezes. 3. He aroused the sympathy and concern of his parents. 4. He became the sensation of the world press.

The sneezing rapidly became less frequent and finally stopped when the boy was told and convinced that he need not go back to school. But the doctors do not consider him cured and he is still under psychiatric treatment, they report to the BRITISH MEDICAL JOURNAL (March 4).

Science News Letter, April 1, 1950

ENGINEERING

Electricity to Half Million More in '49

➤ HALF a million more American farmers got electricity for the first time in 1949 under the Government's rural electrification program.

Power lines that would reach seven times around the world if strung end to end were added in out-of-the-way areas, Claude R. Wickard, Rural Electrification Administrator for the Department of Agriculture, reported.

Most of the lines built with REA funds are cooperatively owned by the farmers serviced, he said. Early in 1950 the total of REA loans passed the two billion dollar mark. Total number of consumers passed 3,000,000.

Today, says Mr. Wickard, more than 83% of American farms have electricity. Only about 10% had power when REA started 15 years ago.

Science News Letter, April 1, 1950

E FIELDS

GENERAL SCIENCE

Conference Expected to Cut Security Rules

➤ A SENATE-House conference committee is set to cut two drastic security provisions out of the House version of the National Science Foundation bill.

Even though the conference committee has not yet been officially appointed, the prospective members, backed by a letter from the Justice Department, are ready to delete House amendments calling for FBI investigation and evaluation of the loyalty of Foundation employees and scholarship holders.

Rep. Percy Priest, D., Tenn., said that it was his guess that the bill as it emerges from conference would not go beyond the regular provisions of existing law for non-sensitive government agencies. Rep. Priest managed the fight for the bill on the House floor.

However, a third security provision requiring that scholarship holders sign a loyalty affidavit will probably remain in the bill. Persons who have held scholarships under other government programs have not been considered employees of the government and, therefore, not subject to the usual loyalty investigation.

Rep. Priest said he thinks that "maybe the loyalty affidavit will be enough."

It is not believed that the conference committee will meet until after April 1.

Science News Letter, April 1, 1950

METEOROLOGY

Every Major City May Face Serious Water Shortage

➤ EVERY major city in the country may some day be faced with a serious water shortage, an official of the U. S. Geological Survey warns.

Dr. A. Nelson Sayre, chief of the Survey's groundwater branch, told the Geological Society of Washington that U. S. water consumption has increased "almost unbelievably" in the last 100 years.

The per capita rate has jumped from a few gallons a day to more than 700 for every man, woman and child, he said.

Yet the Government's data show the country's water resources underground are limited in any particular area, he pointed out. Wet years or dry years may cause some fluctuation. But in the long run there is no detectable change in the net amount of water available underground.

New York's prolonged drought, which has forced the city to try rain-making experiments to relieve its shortage, really caused no more than "a little bump on its water supply curve," Dr. Sayre said.

New York "for some years" has been exceeding its water-collecting facilities by about 12%, he explained.

As other large cities grow or increase their water consumption, according to Dr. Sayre, they may begin competing with each other for underground water. Cities in the Southwest are already facing that problem, he reported.

The answer? U. S. geologists must collect more basic data on water resources. And, Dr. Sayre added, cities must consider the amount of water available before allowing too much water-gulping industrial expansion.

Science News Letter, April 1, 1950

AGRICULTURE

Milk from Cows Given Mold Drugs Not Good for Cheese

➤ MILK from cows being treated with penicillin or aureomycin apparently kills starter organisms used by cheesemakers and cannot be successfully used in making cheese, according to evidence collected by scientists of both the University of Wisconsin and the State Department of Agriculture.

University scientists headed by Dr. G. R. Spencer, of the veterinary science department, are studying the problem. Reports from Wisconsin cheesemakers revealed that trouble with milk in their vats during the curding process had been traced to milk from cattle being treated for mastitis, an udder disease of dairy cows. This disease is now treated with penicillin or aureomycin.

Dr. W. V. Price, of the university's dairy division, said the drugs halt the growth and upset the normal bacteria necessary in good cheese production. While not toxic, milk from cows being so treated presents problems in all types of cheese so far tested.

Dr. J. T. Schwab, chief of the livestock sanitation division of the Wisconsin Department of Agriculture, advises that milk from cows being treated with penicillin or aureomycin should not be marketed during the treatment and for a period of three days after the treatment has been stopped, because small amounts of the drugs get into the milk. Such milk can be fed to calves, pigs or chickens, he said.

Science News Letter, April 1, 1950

MEDICINE

False War Rumor Led To Cortisone's Discovery

➤ A FALSE rumor that the German Luftwaffe was buying adrenal cortex glands of cattle from Argentina during the war was the start of research that gave the world cortisone, effective in treating arthritis.

This was revealed by Dr. Edward C. Kendall, of Mayo Clinic, co-discoverer of this gland drug, in a lecture.

Science News Letter, April 1, 1950

PSYCHOLOGY

Feeling of Pressure May Be Mental Sensation

➤ SCIENTISTS classify touch and pressure as different human sensations. They study the nervous system of the body to learn the differences.

A Canadian professor suggests, however, that the feeling of pressure may be a mental concept rather than a direct sensation in the nerves.

Experimental evidence to back up this theory has been presented to the Royal Society of Canada by Dr. I. MacLaren Thompson, professor of anatomy at the University of Manitoba, and research associates L. W. Denny, H. S. Kimball and J. C. Luce.

Dr. Thompson, a Fellow of the Royal Society, has studied differences in the sensations of pressure and touch since 1933. He reports results of a long series of experiments with human subjects, involving nerve stimulation by electricity and other means.

The experiments tend to support the idea of pressure as a mental concept, he says.

"If this is correct, then the specific mechanism responsible for the feeling of pressure lies not at the periphery (of the body) but in the brain," Dr. Thompson concludes.

Science News Letter, April 1, 1950

PHYSIOLOGY

Three Bottles of Beer Make Driving Dangerous

➤ AS little as three bottles of beer can make a person a dangerous driver, two Swedish scientists have reported to the QUARTERLY JOURNAL OF STUDIES ON ALCOHOL (March) published by Yale University.

Two groups of expert drivers went through special tests designed by Dr. Leonard Goldberg and Kjell Bjerver of Stockholm's Karolinska Institute.

One group had nothing to drink. The other drank three to four bottles of beer or about half a glass of Swedish "brannvin"—the alcoholic equivalent of three or four ounces of American whiskey. Both groups went through the same tests twice.

The non-drinkers improved their performance by 20%, report the two pharmacologists. But the alcohol group showed 25% to 30% deterioration in their driving ability compared to their performance before they drank.

Concluded Dr. Goldberg and Mr. Bjerver, "The role that alcohol plays in causing traffic accidents is probably considerably greater than appears from official statistics. Its action as a factor in traffic accidents begins at a lower alcohol value than has previously been considered."

Science News Letter, April 1, 1950

BIOLOGY

Revolution in Animal Breeding

Ova transplantation and other processes aid in the breeding of better cattle. By this process mongrels can give birth to pure-blooded puppies.

By SAM MATTHEWS

➤ SCIENTISTS have not yet begun to experiment with the reproductive processes of human beings on a large scale, but they have created a revolution along those lines for millions of surprised cows, chickens, dogs, rabbits and horses.

Most of them agree that it is scientifically possible to do the same things for humans, if it is desired.

Artificial insemination is already widely practiced. Now scientists are turning the tables. They have succeeded in transplanting the female eggs and the female ovaries themselves.

Near San Antonio, Tex., scrub cows are carrying the calves of a far superior pure-blooded cow. When the calves are born, scientists will have proved it is possible to transfer successfully the fertilized female egg from one cow to another. Theoretically that would allow fine cattle to have 20 calves per year.

In New Haven, Conn., two dogs have outdone the cows. From two other over-age dogs of different breed, these female mongrels have been given the ovaries themselves—the female sex glands. In due course, they gave birth to puppies which did not look at all like mother.

And all over the nation in 1949, more than 3,000,000 dairy cattle were visited by the white-coated agents of artificial breeding associations.

Artificial Insemination Grows

The growth of artificial insemination among dairy herds has been the most spectacular advance in scientific animal husbandry in the past ten years.

Although 14th century Arabs knew about artificial insemination of livestock, and Russia claims its farmers have used the technique since 1899, it wasn't until the late 1930's that the concept of fertilizing a female animal by artificially injecting the male semen was put to practical use.

Even in 1940, artificial breeding was still confined to agricultural experiment stations.

By 1945, however, there were 225,000 cows enrolled in cooperative breeding associations, and last year more than 3,000,000 cows—over ten per cent of all in the U. S.—were serviced through breeding associations using only 2,000 or so high-caliber bulls. Each bull took care of some 1,300 cows.

Farmers have jumped at the obvious advantages of scientific test tube breeding: it saves the farmer the investment, danger and maintenance costs of keeping a bull; it gives the characteristics of a better bull than he alone could ever afford; it checks the spread of genital disease in his herd, and it allows him to manage better the seasonal production of calves.

Not only cows are being experimented with. Horses, sheep, swine and poultry are all being bred by artificial means. Even honey bees are being improved in this manner.

In nearly all agricultural research stations, artificial breeding is being used on chickens. By crossbreeding, the scientists search for better, more productive strains of animals.

20 Calves a Year Per Cow

A rolling ranch outside San Antonio, manned by scientists of the Southwest Research Institute, founded by Texas oil man Tom Slick, Jr., is the location of a project which would allow a blue-blooded cow to have as many as 20 calves a year, farming them out to the wombs of inferior scrub cattle.

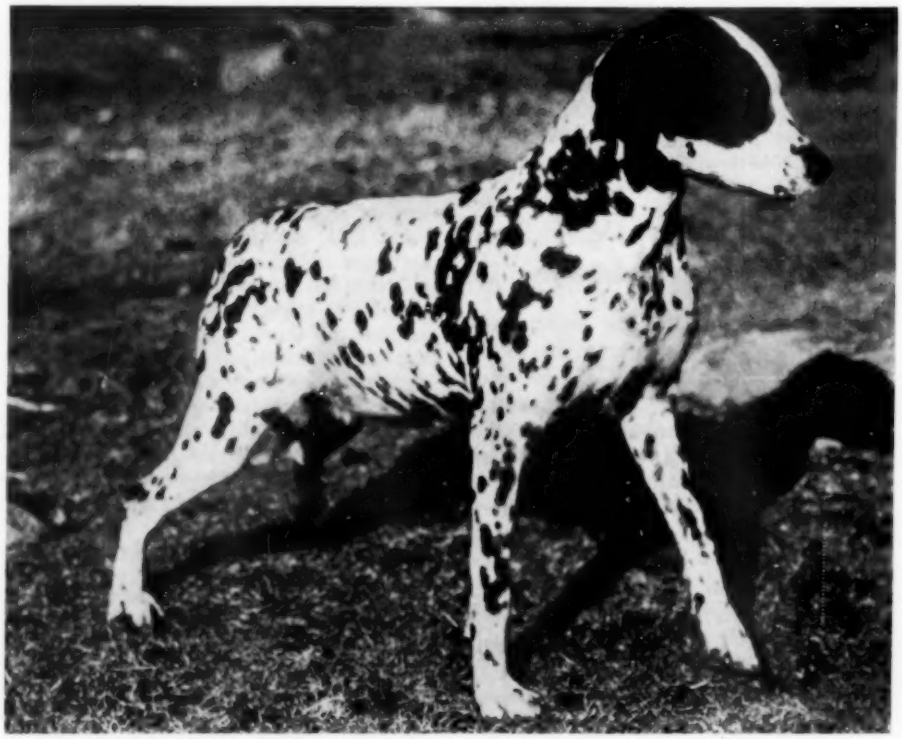
Led by Raymond E. Umbaugh, 28-year-old zoologist, the scientists are working on superovulation and transplantation of ova between cattle.

Nature limits a cow to one ovum each 35 days and only one calf a year. But, by injecting female hormones from the pituitary glands of sheep, Umbaugh's cows have been induced to produce between 23 and 27 ova at the same time.

Then comes the difficult part: taking these super-ovulated eggs from the donor cow, transplanting them to scrub foster mothers, fertilizing them by artificial insemination, and waiting for the foster mothers, nine and a half months later, to give birth to calves with fine characteristics of the original donor cow.

Mr. Umbaugh has followed the lead of Dr. Gregory Pincus of the Worcester Foundation for Experimental Biology in Shrewsbury, Mass., who as far back as 1936 succeeded in producing "fatherless" rabbits from foster mothers.

Dr. Harold Vagtborg, director of the Slick Foundation, called a national conference on ova transplantation last April, pointing out that, "it would be possible to convert all cattle herds into registered stock of the finest quality in a single generation."



IMOGENE, THE DALMATIAN—The Dalmatian was one of the dogs that gave birth to the puppies of other dogs after ovaries were transplanted into them.

BROWNIE, THE MONGREL—The mongrel dog that gave birth to cocker spaniel pups through the process of ova transplantation is shown with Dr. Leon F. Whitney who performed the operation.

Department of Agriculture officials are not so optimistic. They think it might not be practiced economically.

But it is in a dog hospital outside of New Haven that experiments which most foreshadow the future have been going on.

Experimentation Continues

There, Dr. Leon F. Whitney has succeeded in transplanting the complete ovary —the female sex organ—from one dog to another of inferior strain, breeding the second dog by natural means, and obtaining pure-blooded puppies of the donor dog from a foster mother. Working with Dr. Harry S. N. Greene, Yale pathologist, he found that wornout ovaries were rejuvenated when transplanted from an old dog to a young one.

Application to Human Beings

If applied to human beings, this new development might mean that a young woman could give a whole new life cycle to an old woman's sex organs and give birth to the older woman's children. Dr. Greene said he saw no reason why the transfer of human ovaries could not be done.

In cattle, this would mean that a champion pedigreed cow could have calves years after she herself is dead. Dr. Whitney plans to try transplantation of cow ovaries in 1950.

Science News Letter, April 1, 1950

Safety *helmets,* made of glass fiber, have an advantage over metal types because they are not conductors of electricity.

ENGINEERING

Signals Represent Numbers In Memory Tube

➤ A MEMORY tube that will hold electric signals representing numbers which are fed into it, and give them out later when needed, was revealed in New York to the Institute of Radio Engineers by scientists of the Massachusetts Institute of Technology.

The radio tube is for use in high-speed electronic computing machines sometimes called "giant brains." These computers solve in seconds problems that would require months or years by the pencil-and-pad method. Several are in use in various parts of the country. MIT scientists have taken a forward place in their development.

Other memory tubes have been developed, but none have been found entirely satisfactory. Lack of an adequate memory device has been the major problem facing efforts to develop these high-speed computers, the engineers were told by Stephen H. Dodd, Jr., Dr. Hans Klemperer and Patrick Youtz, all of MIT. This new 400-digit memory tube will solve this problem, it is claimed.

The new tube looks like a glass automobile muffler with an extra pipe coming out of one end. Literally a storehouse for numbers, it will hold its information indefinitely, as long as power is supplied. It can receive a number to be remembered in twenty-millionths of a second and give one out, when needed, just as fast.

Science News Letter, April 1, 1950

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PHYSICS

Better Electrical Storage

➤ EXCEPTIONAL electrical properties of the chemical, barium titanate, give definite promise of useful devices not yet dreamed of, Dr. R. G. Breckenridge of the National Bureau of Standards stated in Washington, D. C.

"It is even possible that future development of somewhat similar materials will lead to more effective electrical storage devices," Dr. Breckenridge said. He spoke as guest of Watson Davis, director of Science Service, on the nationwide Columbia network.

Barium titanate is a chemical compound composed of barium, titanium and oxygen. The sensitive atoms of this compound show a remarkably quick response to the slightest changes in pressure, temperature or electrical field.

So outstanding are the electrical properties of barium titanate that it is given the special name, ferroelectric. Only two other compounds now known are similarly classified.

Barium titanate is now being used for phonograph needles. The very tiny indentations in the groove of the record are picked up by the needle and sent back to a crystal of barium titanate.

Dr. Breckenridge explained that the sensitive atoms of this compound have the ability to develop an electrical charge when they are deformed. The small changes picked up by the needle from the groove of a record and sent to the crystal of barium titanate cause the development of an electrical charge. This electrical charge, after being amplified, comes out of the loudspeaker as sound.

The characteristic of building up an electric charge when deformed is known to the physicist as piezoelectricity. The reverse of the same process is used in the undersea detection of submarines through Sonar.

"Here the crystal is driven by high frequency electrical currents," Dr. Breckenridge explained. "It produces ultra-sonic waves that travel through the water for a considerable distance. When these waves strike an object, they are reflected back and detected actually by the same crystal."

Dr. Breckenridge said that the discovery of this class of material is just as important to the electrical industry as the discovery of a new class of material, that would behave as iron does, would be in the magnetic field. He was one of the pioneer workers on the electrical properties of barium titanate at Massachusetts Institute of Technology.

Science News Letter, April 1, 1950

DENTISTRY

Ways to Stop Tooth Bleed

➤ THE three most useful chemicals for stopping bleeding after a tooth has been pulled are: 1. epinephrine, or adrenalin as it is popularly known; 2. thrombin; 3. a thrombin carrier such as fibrin foam, soluble cellulose or gelatin foam.

These three substances are listed, along with other anti-bleeding measures, in a report by Dr. E. P. Cronkite of the Naval Medical Research Institute and R. M. Irland, biologist at the same institution, to the American Dental Association in Chicago, Ill.

In normal persons the first and most important step for stopping bleeding is to tie the accessible bleeding points and sew the tissues together carefully unless the wound must be left open for drainage, as in case of infection.

If these two measures do not stop the bleeding, local pressure may be enough. If this does not work, thrombin powder or solution should be applied. Thrombin is one of the blood's own chemicals that takes part in the clotting mechanism. If it is necessary to use a pledget to apply the thrombin, as in a tooth socket or in the nose, fibrin foam, soluble cellulose or gelatin foam saturated with thrombin are advised. These packs can be left in place and help support the tissues as well as helping to stop bleeding.

Before applying thrombin, it is sometimes desirable to apply a solution of epinephrine to constrict the small blood vessels.

Substances formerly used to stop bleeding after tooth extraction, such as tannic acid, silver nitrate, alum, chromic acid, zinc, copper and iron salts, have outlived their usefulness, in Dr. Cronkite's opinion. Their value is based on their ability to coagulate proteins, such as are contained in blood, he explained. They can do this but at the same time they coagulate healthy tissue and produce unnecessary and usually undesirable destruction of the tissues.

Vitamin K is valuable for stopping bleeding only in persons with a deficiency of the vitamin or some condition that makes them unable to utilize it from food.

Special measures, including use of anti-hemophilic globulin available through the American Red Cross National Blood Program, can make it safe for hemophiliacs to have teeth extracted without dangerous bleeding.

Science News Letter, April 1, 1950

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by PERCY A. MORRIS

". . . a most interesting book. Gives a clear analysis of the entire snake family and their background." *Saturday Review of Literature.*

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MEDICINE

Chemical for Insane

➤ NEW hope for a chemical conquest of insanity is held out by preliminary results with a combined vitamin-hormone treatment reported in the LANCET (March 25).

The treatment markedly improved all types of mental disorders except the neuroses, Drs. E. H. Cranswick and T. C. Hall of Runwell Hospital report.

The vitamin used is ascorbic acid, also known as vitamin C, the anti-scurvy vitamin of citrus and other fruits and vegetables. The hormone is deoxycortone, from the adrenal gland cortex, a cousin of the famous anti-arthritis hormone, cortisone.

Fourteen out of 16 schizophrenics, depressives and manics who had been sick less than one year became more rational and cheerful for a week after a single injection of the vitamin and hormone.

After a series of injections, the improvement has persisted for three months so far. The physicians believe further trials of this treatment are warranted.

Cortisone and ACTH, the pituitary gland hormone which stimulates the adrenals to produce cortisone, have already been suggested as possibly beneficial in mental disorders, especially depressions. This is on the basis of the marked cheerfulness, or euphoria, noticed in arthritis patients getting either of these hormones, and the belief that the adrenal gland is involved in mental sickness. Trial of ACTH for mental sickness is reported under way in at least one clinic in the United States.

Scarcity of both cortisone and ACTH limit the possibilities of their use in both mental disorders and arthritis. The combination of vitamin C and deoxycortone, both available in plentiful supply, has, however, already been reported effective as a substitute for cortisone in arthritis.

Science News Letter, April 1, 1950

GENERAL SCIENCE

Scientifically Armed Sub

➤ THE BRITISH submarine H.M.S. Talent will sail from Malta early in May armed to the teeth . . . with weapons of peace-time science.

Its job for Britain's Royal Society will be to measure the pull of gravity on the floor of the Eastern Mediterranean.

Geologists hope the results will give them a key to an apparent paradox in earth movements in the Mediterranean basin. The coast of Africa to the south is thought to have remained virtually unchanged over millions of years. Yet Italy, Greece and Turkey to the north have undergone great changes in recent geologic times, evidenced by earthquakes and still-active volcanoes.

The Royal Navy will get answers of another sort. Calculations will be made of "sea slope" in the Mediterranean which often throws ships navigating by the stars off course.

Scientists know that large masses of material, such as mountains, attract the sea toward them. The surface of the sea near the Island of Cyprus, for example, "slopes" down away from the land enough to cause half-mile errors in navigational fixes.

Because sensitive instruments can be taken below the layer of waves and turbulence on the surface, a submarine can survey gravitational differences, or anomalies as they are called, where a surface ship would fail. The chief apparatus, a complex pendulum which must have a steady platform, was invented by the Dutch geologist Dr. F. A. Vening Meinesz and first used by him in a submarine in 1926.

Gravitational differences, although infinitesimal, can reveal large masses of rock or minerals below the sea bed and help chart submerged geologic structures.

The expedition is to be directed by scientists of Cambridge University.

Expected to take two months, its results will involve reading nearly a third of a mile of detailed photographic records.

Science News Letter, April 1, 1950

MINING

Brazil Oil Shale Deposits May Solve Fuel Problem

➤ BRAZIL is looking toward its extensive oil shale deposits to find local fuel to solve its industrial and economic problems, the U. S. Bureau of Mines revealed in Washington.

This American agency, which stands in the forefront in developing the use of domestic oil shale, has made a recent investigation of Brazil's deposits. Its findings have just been made available in a report which can be obtained free from its Publications Distributing Section, Pittsburgh, Pa. The title is "Oil Shale in Brazil."

Oil shale and other rocks from which oil can be obtained have been found in 10 Brazilian states. The chief development work has been done in the Tremembe-Taubate area deposits. This is in the State of Sao Paulo.

As early as 1881, oil shale from this deposit was used to make illuminating gas. Although used only intermittently since 1897, a battery of 20 retorts was converted to the making of oil from shale following the recent war. Oil yields as high as 36.5 gallons per ton of shale were recovered from Tremembe shales in the U. S. Bureau of Mines laboratories, Laramie, Wyo.

Science News Letter, April 1, 1950

Words in Science
STATICS-KINETICS

➤ STATICS and kinetics are two major branches of the science of mechanics that tells you what happens when a solid material is pushed, pulled, twisted or squashed —when forces are applied to it.

Statics is at work when the particle or object doesn't move. A force one way is exactly matched by an equal force the other way. The object sits still and takes it.

If the forces are not equal, the object must move, jump, slide or twirl in answer to the greater exertion of energy upon it. Kinetics, sometimes called dynamics, will tell you how it will move, the effects of the unbalanced forces.

A third term, closely related, is kinematics. That is the science of motion itself, without regard to forces or bodies of matter.

Science News Letter, April 1, 1950

Sky writing is proposed which will use seven airplanes flying in straight formation; the center plane will send radio signals to activate smoke apparatus on the others, releasing smoke dots to outline block letters.

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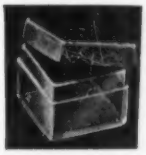

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WILDLIFE

NATURE RAMBLINGS

Porcupine

➤ THE Achilles' heel of the porcupine is its soft underbelly. A deft predator that has learned to respect the formidable armament of the porcupine can flip the prickly creature onto its back and quickly kill it.

But the hunter whose training in woodland tactics is deficient on this particular point is in for a lesson it will not soon forget. However big or ferocious it be, whether bear or mountain lion, wolf or fox, lynx or coyote, it makes no difference. To attack a porcupine from the prickly side is at least sharply painful, and at worst deadly fatal. And, the belly excepted, all sides are prickly.

Unmolested, porcupines are docile, harmless creatures. They waddle along the ground or climb slowly in trees, preoccupied with the search for bark, mistletoe, and other vegetative delicacies. They are not meat eaters. But if an enemy appears before the safety of den or tree can be reached, the porcupine bristles. The long, strong, sharp quills which cover its body from head to tail, stand out from the body, like pins in a pin-cushion with the pointed ends out.

The porcupine takes a position with its tail to its foe, and as the puzzled would-be attacker circles looking for some place to catch hold of its prey, the porcupine shuffles around to keep its tail pointed to the intruder. If the latter is foolish enough to lunge to the attack, the porcupine delivers a powerful upward blow with its tail, driving quills into the attacker's chin and throat, and at the same time guiding the attacker's mouth and face into the thicket of quills on its back.

The quills are as much as five inches long and barbed. It takes a man with pliers to pull one out. An animal cannot remove them unaided. They work their way in deeper and deeper. Experts disagree on how serious these quill wounds are. Some believe they can lead to death, either from starvation resulting from quills in the mouth, making eating impossible, or else from the eventual penetration of a quill to some vital part. Others think the quills are absorbed eventually by the body tissues, causing pain but no serious harm.

It is popularly thought that porcupines throw their quills like darts in self-defense. Zoologists who have studied the matter think that strictly speaking this is not so. Quills are constantly growing, being lost, and growing in again. The older quills are quite loose. It sometimes happens that a disturbed porcupine will flip up its tail and a loose quill will fly off. The odds against such a flying quill hitting a target, to say nothing of sticking into it, are very slim.

Science News Letter, April 1, 1950

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ANNUAL REVIEW OF UNITED NATIONS AFFAIRS 1949—Clyde Eagleton, Ed.—*New York University Press*, 322 p., $5.00. The proceedings of New York University's first Institute for Annual Review of United Nations Affairs. It includes a review of the year's happenings in the secretariat, the general assembly and the security council.

AMERICAN COLLEGE OF PHYSICIANS DIRECTORY, 1949—*American College of Physicians*, 747 p., $5.00. First edition published since before the war.

BRING OUT YOUR DEAD: The Great Plague of Yellow Fever in Philadelphia in 1793—J. H. Powell—*University of Pennsylvania Press*, 304 p., illus., $3.75. A historical account of this 18th century catastrophe.

DEVELOPMENTS IN THE WEAR RESISTANCE OF TEXTILES AND RELATED PAPERS PUBLISHED IN GERMANY DURING WORLD WAR II—U. S. Army European Command, Compiler—*U. S. Dept. of Commerce*, 368 p., illus., $5.00. Most of the papers translated and reproduced in this volume appeared in *Melliand Textilberichte*, a German textile trade journal, between 1939 and 1947.

ELEMENTARY PILE THEORY—Harry Soodak and Edward C. Campbell—*Wiley*, 73 p., illus., $2.50. Presents fundamental ideas associated with the atomic reactors.

THE ENVELOPE: A Study of the Impact of the World upon the Child—James S. Plant—*Commonwealth Fund*, 299 p., $3.00. The author discusses 21 problems which he found were common to most of the children with whom he worked for 25 years as director of the Essex County Juvenile Clinic in Newark, N. J.

GEOLOGY AND GROUND-WATER RESOURCES OF A PART OF SOUTH-CENTRAL KANSAS: With Special Reference to the Wichita Municipal Water Supply—Charles C. Williams and Stanley W. Lohman—*State Geological Survey of Kansas*, 455 p., illus., paper, 40 cents. This report covers an area of about 2,340 square miles in south-central Kansas.

GOOD FOOD FROM THE NEAR EAST: Five Hundred Favorite Recipes from Twelve Countries—Joan Rowland—*Barrows*, 274 p., $2.75. A collection of cookery information.

HOMER THE TORTOISE—Margaret J. Baker—*Whittlesey*, 149 p., illus., $2.00. The story of a child's first animal pet. Delightfully illustrated.

HOW SCIENCE TEACHERS USE BUSINESS-SPONSORED TEACHING AIDS—Advisory Council on Industry-Science Teaching Relations—*National Science Teachers Association*, 36 p., illus., paper, $1.00.

HOW TO MAKE YOUR FARM PAY: A Practical Guide for Midwest Farm Operators—Carl C. Malone—*Iowa State College Press*, 371 p., illus., $3.75 (Leatherette: $2.50). Discusses the basic principles for successful farming.

INDIANS OF NEW MEXICO—*Gallup Chamber of Commerce*, 10 p., paper, free upon request to publisher, Gallup, N. Mex. A brief description of the Navaho, Pueblo and Apache Indians.

LET'S GARDEN—Enid Blyton—*Macdonald*, 205 p., illus., $2.00. If you have a child who would like to start a garden, here is a book with a wealth of information. Well illustrated.

MEDICINE OF THE YEAR: Second Year 1950—John B. Youmans, Editorial Director—*Lippincott*, 204 p., $5.00. A review by leaders in the medical field of the major medicinal advancements during the past year.

THE NATURE OF NATURAL HISTORY: A Study in the Approach of Science to the Living World of Which We Form a Part—Marston Bates—*Scribners*, 309 p., $3.50. A description of some of the working principles underlying the scientific terminology such as symbiosis or parasitism or ecology. For the layman primarily.

SEA TURTLES AND THE TURTLE INDUSTRY OF THE WEST INDIES, FLORIDA AND THE GULF OF MEXICO, WITH ANNOTATED BIBLIOGRAPHY—Robert M. Ingle and F. G. Walton Smith—*University of Miami Press*, 107 p., illus., paper, $1.00.

SIPHONAPTERA FROM CENTRAL AMERICA AND MEXICO: A Morphological Study of the Aedeagus with Descriptions of New Genera and Species—Robert Traub—*Chicago Natural History Museum*, 127 p., illus., paper, $4.00. A study of the flea fauna of this area. 54 full-page plates are included.

6 EASY WAYS TO RECOGNIZE A BAD CHECK—C. H. Fletcher—*Fraud Detection and Prevention Bureau*, 22 p., illus., paper, $1.00.

Science News Letter, April 1, 1950

The *horse* has the largest eyes of any land animal except the elephant; this accounts for its excellent vision both day and night.

The *Tigris-Euphrates Valley*, the site of the world's first large-scale irrigation project, could support six times its present population of 8,000,000 if irrigation was developed to the full limits.

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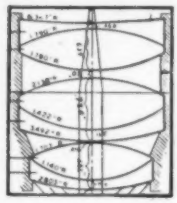

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AUTOMATIC TIMER for public speakers operates on three flashlight batteries and utilizes a six-volt buzzer. The allotted time is set on the device. A warning light turns on automatically two minutes before the end of the time. The buzzer operates at the end of the period.

Science News Letter, April 1, 1950

ROLLER-SKATE, to put under a flat tire on the automobile so that the car may be hauled or driven to a repair station, consists of fabric covering on a light metal frame under which are rubber-tired wheels. By means of a ramp block, the flat tire is easily driven into the cradle of the skate.

Science News Letter, April 1, 1950

INNER TUBE for automobile tires, made with nylon cord for reinforcement, will outwear as many as three sets of tires, it is claimed. In event of a puncture, the nylon construction squeezes rubber around the puncturing object, thereby preventing sudden flats and permitting only slow leakage.

Science News Letter, April 1, 1950

RADIOACTIVITY DETECTOR, shown in the picture, is designed for rugged field use in prospecting for such radioactive ores as uranium, thorium and radium. It contains a small Geiger tube, and the entire instrument is so constructed that it will operate even after being submerged in water.

Science News Letter, April 1, 1950

POCKET-SIZE TELESCOPE, of five-inch length and designed for the sportsman or naturalist, offers six-power magnification. It has a scientifically computed system of six lenses that are claimed to give full correction for spherical and color aberration.

Science News Letter, April 1, 1950

SOLDIER KIT for Arctic uses by downed airmen includes 22 packages of equipment needed to keep a man alive for several days. Included are a sleeping bag, a canned heat stove, 10-day food rations, revolver, signalling devices, compass and waterproof matches.

Science News Letter, April 1, 1950

ALCOHOL BLOW TORCH, an improved type for use in soft soldering, has a gun grip plastic handle for easy holding and a sliding windshield to permit its use indoors or outdoors with equal efficiency. It produces a flame of over 2700 degrees Fahrenheit.

Science News Letter, April 1, 1950

BABY SPOON, with a scoop-like bowl "swiveled" to the handle, stays level when being raised to the mouth. When the child puts the spoon against food or against the dish, the slightest pressure downward on the handle keeps the bowl firmly in one position.

Science News Letter, April 1, 1950

Do You Know?

Winter *laying* of well-bred American hens is now nearly on a par with summer laying.

Creatures with *slit pupils* in the eye, like the house cat, are mainly those that are active both by day and by night.

The average *painter* using a brush spends about one hour of an eight-hour work day in merely dipping the brush into the paint pot.

So-called snowshoe *rabbits* of western mountain areas have feet densely covered with long fur, enabling them to travel on snow.

Floating on his back, the sea *otter* of the Pacific coast uses his chest for a table on which to tear apart sea urchins gathered for food.

Although there are many natural caves in the United States, few of them would be suitable for military purposes or underground factories because of their irregular shape.

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